

VALIDITY OF THE SPECIES *HELIOTHIS SUBFLEXA* (GN.) (LEPIDOPTERA).

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A comparative study of *Heliothis virescens subflexa* (Gn.) and *Heliothis virescens* (F.) indicates definite and persistent structural differences in the genitalia and in the larvae which suggest that full species status should be restored to *subflexa*.

Heliothis subflexa was described by M. Achille Guenée in 1852 (Species Général des Lépidoptères, II, 175, 1852, *Aspila*). It was still accepted as a valid species in 1902 by Dyar in his List of North American Lepidoptera (No. 2297, *Chloridea*) and in 1903 by John B. Smith in the Check List of the Lepidoptera of Boreal America (No. 2501, *Chloridea*). In the latter year, however, Hampson in the Catalogue of the Lepidoptera Phalaenae in the British Museum relegated it to the status of one of four varieties of *Chloridea virescens* (F.). Barnes and McDunnough's Check List of Lepidoptera, 1917 (No. 1091a) and Dr. McDunnough's Check List of Lepidoptera, 1938 (No. 2933a) show it as a geographical race of *virescens* (*Heliothis*).

Heliothis virescens (F.) is a common moth characterized by a yellowish green forewing with three prominent whitish oblique bands, paralleled by darker green on their outer sides. The hind wing is white with a dark band on the margin which varies greatly in extent. *H. subflexa* differs from *virescens* by the absence of the band on the hind wings which are immaculate.

Preparation of a series of slides of male genitalia reveals the following differentiating structural characters: In *subflexa*, hair tufts are found on each side of the eighth abdominal segment; the base of the vinculum is an elongated curve terminating in a point; the length of the harpes ranges from 4 mm. downward. In *virescens*, the abdominal hair tufts are absent; the base of the vinculum is rounded; long hair pencils extend from the base of the harpe to the tip; and the length of the harpes ranges from 4 mm. upward.

Comparison of female genitalia at the United States National Museum reveals differences which justify specific separation. The ductus bursae of *virescens* is strongly constricted before the ostium. Anterior to this constricted membranous portion, the ductus bursae is ribbed with longitudinal sclerotized ridges. The structure of *subflexa* is similar but the membranous portion of the ductus bursae before the ostium is twice as broad and about half as long as that of *virescens* and the portion anterior to it is sclerotized in the form of crinkly ridges.

Comparison of the larval stage was made from material preserved in alcohol. Accordingly too much stress should not be laid on color differences, which also vary with the food plant and the stage of the larvae. An examination of the standard pattern surrounding the abdominal spiracles indicates marked structural differences. In *subflexa*, the spiracle is surrounded by four heavily pigmented sclerotizations or tubercles at the bases of abdominal setae III, IIIa, IV, and V, respectively: a very prominent tubercle above, two of medium size posteriorly and ventrally, and a small anterior tubercle. In *virescens*, the dorsal and posterior tubercles are both of medium size, the ventral one is smaller and somewhat distant, while the anterior tubercle has dwindled to microscopic proportions.

The various differences cited above go beyond those of geographical variety or race. They are not isolated phenomena in individual specimens. They are substantial in number and definite in character. They occur in both larval and adult forms. Most of them, being structural, are not the result of local variations in temperature or moisture. In the aggregate they justify the recognition of *Heliiothis subflexa* (Gn.) as a valid species. Because of the economic importance of *Heliiothis virescens* (F.) (True Bud-worm on tobacco, etc.), economic entomologists might well follow out this differentiation of *subflexa* with a view to determining its biological implications. Food plants of *subflexa* are reported to be deadly nightshade (*Solanum nigrum* L.) and various species of ground cherry (*Physalis* L.).

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